

The Ihagee Vielzweck

The remarkable value of the Ihagee Vielzweck consists in its rendering the EXAKTA Varex, including the previous models, extremely versatile and economical. These cameras, it is true, have, with very simple accessories, proved serviceable in many fields, the Vielzweck, however, meets the most exacting requirements of the serious amateur, the professional photographer, scientist, and artist. The Vielzweck, or its individual parts, will therefore always be most suitable where the EXAKTA Varex is continually being assigned to some special purpose.

A decisive factor is that the Vielzweck is composed of standardized parts, or part groups, which can be employed separately or in various combinations as may suit your budget or your particular requirements. Thus, you are in a position gradually to complete your equipment.

The object of this booklet is to summarize the uses of the Vielzweck in the following, most important spheres of work; it is to be noted, however, that the equipment may conveniently be arranged to accomplish any other task as well.

The principle applications of the Ihagee Vielzweck

Close-ups	1-21	Photographing cavities of the human and animal body	35-37
Copying	1-21	Photomicrography	28-32
Duplicate negatives	24-27	Producing transparencies	24-27
Macrophotography, see Close-ups		Stereo-Photography	33-34
Magnifier exposures	1-21	The tripod in connection with long-focus and heavy lenses	22-23
Medical photography	35-37		

There may be slight deviations between the models and the illustrations in this booklet.

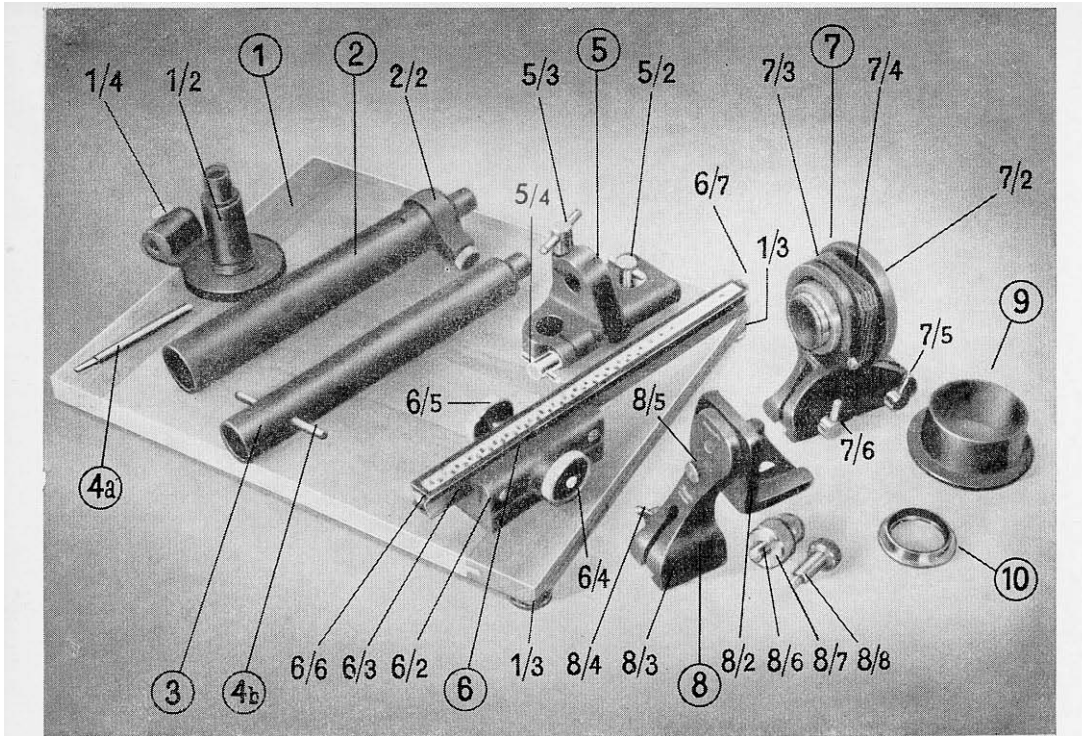


Fig. 1: Single parts of the copying stand and their supplements

Single parts and part groups of the Ihagee Vielzweck-Equipment

1	Baseboard	7/2	Lens holder	12/8	Projections on picture gate to hold Transparency copying screen (Fig. 25)
1/2	Column foot	7/3	Camera holder	12/9	Film trays (Fig. 25)
1/3	Adjusting screws	7/4	Bellows	12/10	Lever for raising and lowering the picture gate (Fig. 25)
1/4	Holder for lighting disposition	7/5	Locking lever on lens holder	12/11	Ground glass for focusing (Fig. 25)
2	Lower column	7/6	Locking lever on camera holder (Fig. 2)	12/12	Slit nut for focusing (Fig. 25)
2/2	Stop ring for Photomicrography	7/7	Screw on lens holder	12/13	Zero mark (Fig. 25)
3	Upper column	7/8	Blocking lever on bayonet (Fig. 6)	12/14	Holder (Fig. 25)
4 a	Levers for screwing the columns	8	Swing angle top	12/15	Transparency copying screen
4 b	Levers for unscrewing the columns	8/2	Angular piece	13	Lens used with Kolpofot (Fig. 34)
5	Headpiece	8/3	Support	14	Central Flash Unit (Fig. 34)
5/2	Screw bolt	8/4	Lever	15	Lighting disposition (Figs. 12 and 13)
5/3	Fastening screw for vertical position	8/5	Fastening knob for angular piece	15/1	Jointed holder-system (Figs. 12 and 13)
5/4	Fastening screw for horizontal position	8/6	Tripod bushing with continental thread	15/2	Cross-hole nut (Figs. 12 and 13)
6	Focusing slide	8/7	Counter nut	15/3	Reflectors (Figs. 12 and 13)
6.2	Sliding track	8/8	Tripod bushing with English thread	15/4	Clamping ring (Figs. 12 and 13)
6/3	Gliding rail	9	Light-protection tube	15/5	Cross-hole bolt (Fig. 12)
6/4	Right-hand rack-and-pinion knob (also fastening knob)	10	Microscope ring II	15/6	Supports (Figs. 12 and 13)
6.5	Left-hand rack-and-pinion knob	11	Tripod plate (Fig. 22)	15/7	Cable (Figs. 12 and 13)
6.6	Locking screw unilaterally frased	11.2	Gliding rail of tripod plate (Fig. 22)		
6/7	Locking screw	12	Transparency copy equipment (Figs. 25 to 27)		
6/8	Fixing knob for transparency copy equipment (Figs. 14 and 15)	12/3	Coupling rod (Fig. 25)		
7	Bellows top attachment	12/6	Picture gate (Fig. 25)		

For a better understanding of the text, it is advisable to leave the page showing Fig. 1 unfolded while studying the contents of this booklet.

Leading Continental scientists and research-workers choose EXAKTA equipment to meet the most demanding requirements in difficult investigations. The fact that this camera and its accessories have so well fulfilled these needs should give confidence to others requiring apparatus of the highest quality and versatility. Many amateur photographers and photographic-journalists also use the EXAKTA in their work. Our Advisory Service is at all times at your disposal.

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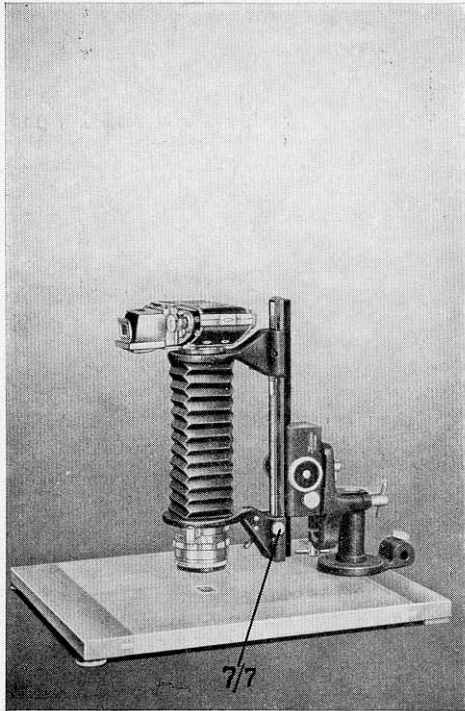


Fig. 2

The baseboard of the repro attachment

For copying and close-up work with the apparatus in vertical position, the wooden baseboard (1), having a surface of approx. 30×30 cm., is designed to hold the object (allowing for DIN format A4 = $21 \times 29,7$ cm.). To ensure permanent steadiness while working, the baseboard (1) is fitted with two adjusting screws (1/3) for balancing out any unevenness of the table on which the apparatus may be standing. You adjust one of the two screws, or both, until the whole equipment stands firmly. For photographing transparent objects, a lightbox may be placed on the baseboard (1) – see Fig. 5. This enables you to illuminate your object from below, or if desired, with a combination of upper and lower light. With the aid of the lightbox you will be able to make small transparencies from larger negatives: The negative is placed on the opaline glass plate of the lightbox, with the light source underneath the glass, and the exposure is

Fig. 2: Repro attachment 1, bellows attachment fixed to column foot: vertical position

Fig. 3: Repro attachment 1, bellows attachment fixed to lower column: vertical position

Fig. 4: Repro attachment 1, bellows attachment fixed to upper column: vertical position

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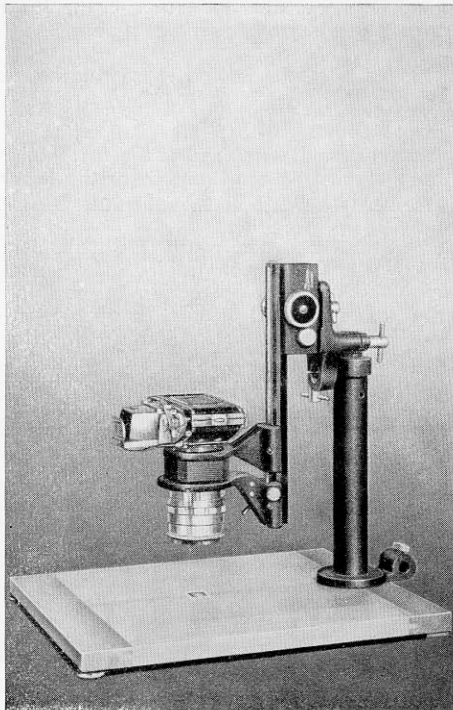


Fig. 3

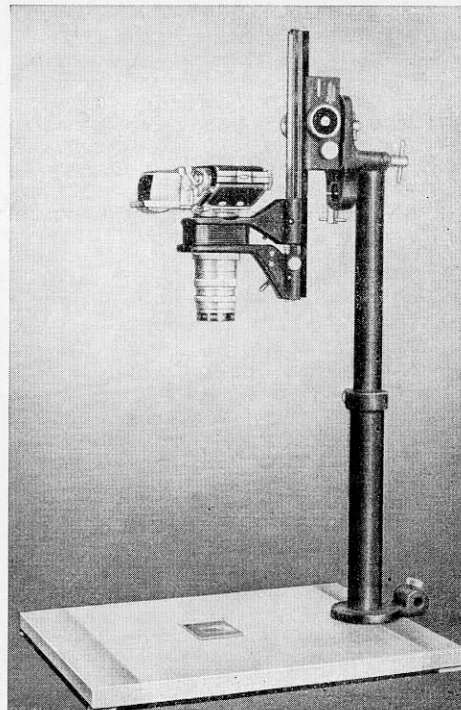


Fig. 4

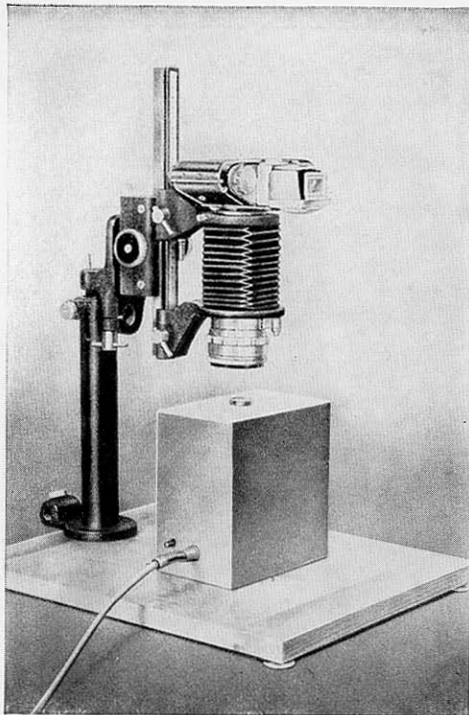


Fig. 5

made with the EXAKTA Varex, in the same manner as any other reproduction.

The metal columns of the repro attachment

The metal column foot (1/2) is securely attached to the baseboard (1). The metal columns (2 and 3) are fixed to the foot, either both together, Figs. 4 and 9, or the lower column (2) alone, Figs. 3, 5, and 8. This lower column (2) is supplied with a stop ring (2/2) the use of which is explained in section E (Photomicrography). Two metal pins (4 a and 4 b) are added for securing the columns (2 and 3) together and fastening them on to the column foot (1/2), or for loosening them easily. These pins are run through the holes in the columns (2 and 3), forming lever arms which, as just mentioned, serve as an energy-saving device in fastening and disconnecting the columns. The holding device (1/4), with fastening screw, on the column foot (1/2) is designed for fixing the Lighting Disposition (see pages 14 and 15).

The headpiece of the repro attachment

Connecting the columns to the focusing slide (6) is the headpiece (5) which, depend-

Fig. 5: Repro attachment 1 with bellows attachment and additional use of lightbox: vertical position

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ing on the photographic task, is fixed either to the column foot (1/2) – Figs. 2, 6, and 7 – or to the lower column (2) – Figs. 3, 5, 8, 10, 12, and 28 to 31 – or to the upper column (3) – Figs. 4 and 9. In assembling these parts you must take into account whether the focusing slide (6) is to be positioned vertically or horizontally.

For vertical work the headpiece (5) has to be placed on the pin of the columns (2 or 3), or of the column foot (1/2), so that the fastening plate with the thread bolt (5/2) is mounted in the vertical position – Figs. 2 to 5, 7 to 9, 12 and 13, 28 to 31. Turn the fastening screw (5/3) to the right, and the headpiece (5) is fixed. The desired scale of reproduction determines whether the column foot (1/2) alone will suffice or whether you will have to add the columns (2 and 3), for the smaller the distance from lens to baseboard (= lens to subject), the larger will be the image in the negative, and the longer is the distance between lens and film plane. – Please refer also to "Focusing" on page 12.

Fig. 6: Repro attachment 1, bellows attachment fixed to column foot: horizontal position. Special 50 mm. lens, f/2.8, with sunk mount

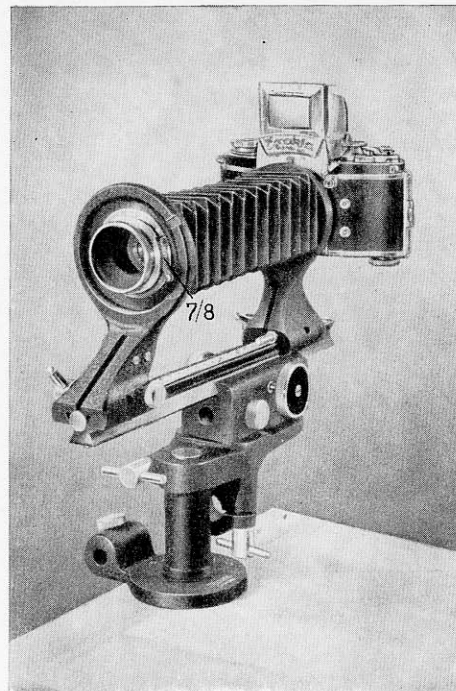


Fig. 6

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For horizontal work, the headpiece has to be fastened in the horizontal position, whereby the thread of the bolt (5/2) points upwards. The headpiece is provided with an additional fastening screw (5/4) for horizontal fixing. Figs. 6, 10, 11, 26, and 27 depict the horizontal position as needed for various kinds of exposures at a longer distance, for copying larger objects fastened to a wall, or for close-ups. Of course it is possible to use the column foot (1/2) alone or, as the case may be, the column foot combined with the columns (2 and 3) or with the lower column only.

The focusing slide

The focusing slide (6), as already mentioned, and as shown in Figs. 2 to 13 and 26 to 31, is screwed to the headpiece (5) by means of the screw bolt (5/2). For this purpose, the block-shaped sliding track is provided with a corresponding thread. The other parts belonging to the focusing slide (6) are: the sliding track (6/2), the rack-and-pinion

Fig. 7: Repr attachment 2, swing angle attachment fixed to column foot: vertical position

Fig. 8: Repr attachment 2, swing angle attachment fixed to lower column: vertical position

Fig. 9: Repr attachment 2, swing angle attachment fixed to upper column: vertical position

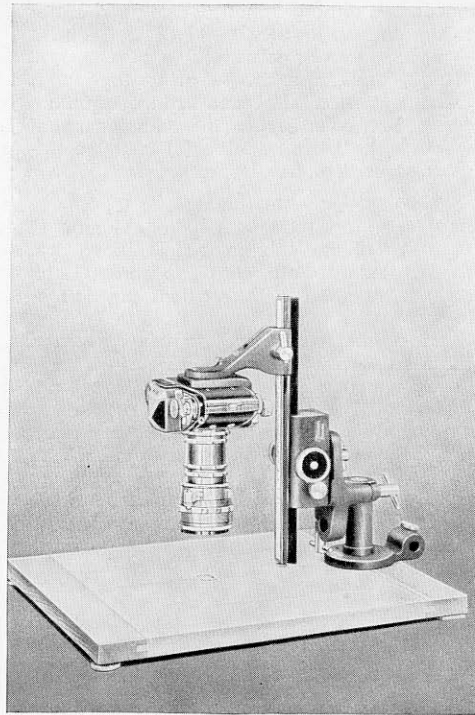


Fig. 7

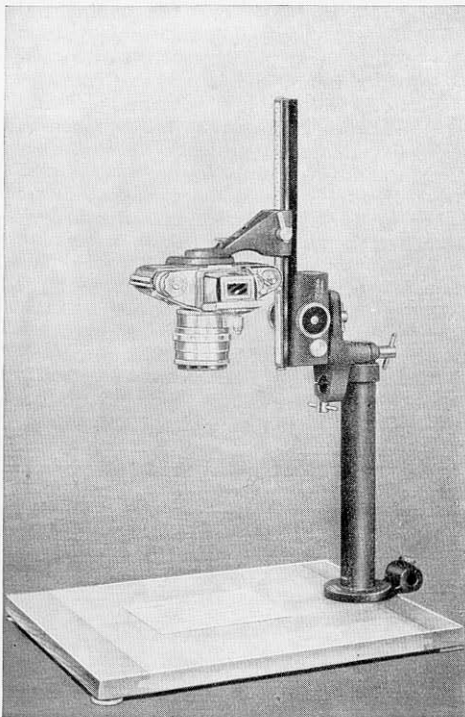


Fig. 8

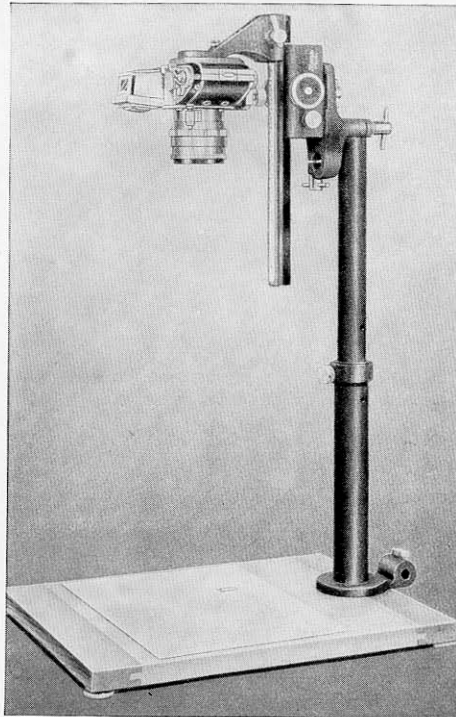


Fig. 9

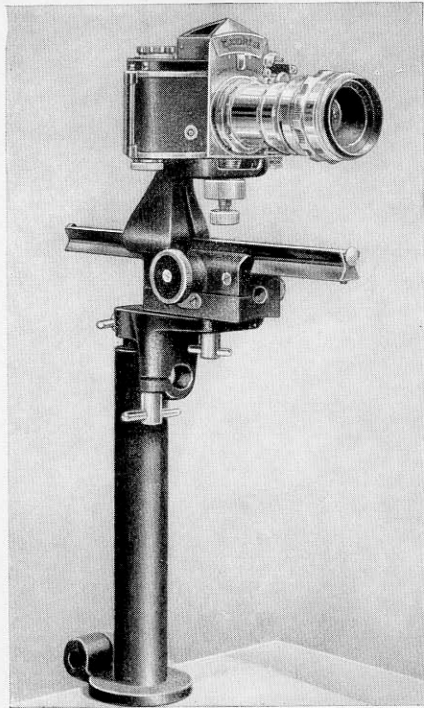


Fig. 10

knobs (6/5 and 6/4) and the gliding rail (6/3). This gliding rail is moveable to and fro in the sliding track by means of a cog-wheel mechanism and is provided with two scales and with the locking screws (6/6 and 6/7). The head of one of the two screws (6/6) is unilaterally frased. The rack-and-pinion knobs (6/4 and 6/5) are for the purpose of moving the gliding-rail mechanism when focusing. With the apparatus in vertical working position, the rack-and-pinion knob (6/4) may also be used to fix the gliding rail (6/3) to avoid it being dragged down by the weight of the camera. In this case the knob (6/4) has to be screwed towards the block-shaped sliding track (6/2) by clockwise rotation, whereby the opposite knob (6/5) must be held tight. As soon as the rack-and-pinion knob (6/4) is to act once more as focusing knob it must be turned away from the sliding track (6/2) and fixed in its position, during which performance the knob (6/5) must again be held tight.

Either the bellows top attachment (7) or the swing angle top (8) will be required to complete the equipment.

Fig. 10: Repro attachment 2, swing angle attachment fixed to lower column: horizontal position

The bellows attachment

The component parts of the bellows attachment are the focusing slide (6), the bellows top attachment (7) with the lens holder (7/2), the bellows (7/4), and the camera holder (7/3). Camera holder and lens holder are pushed on to the gliding rail (6/3) of the focusing slide (6). Make sure that they stand close together and are connected firmly by fastening the screw (7/7) on the lens holder – Fig. 2 – as shown in Figs. 1 and 14. The levers (7/5 and 7/6) are loosened and standing upright. First the lens holder (7/2) and then the camera holder (7/3) are pushed on to the tail-end of the gliding rail (6/3) (recognizable by the largest values on the scale and by the rotatable locking screw (6/6) with the unilaterally frased head). Before pushing on the bellows top attachment (7), this locking screw (6/6) must be set so that the frased section of the screw lies on a level with the upper surface of the gliding rail (6/3). Having pushed the holders on, tighten the locking screw (6/6) slightly, causing the round part of the screw head to project above the surface of the gliding rail and preventing an inadvertent slipping off

Fig. 11: Repro attachment 2 with swing angle attachment: horizontal position, swung around for vertical exposures

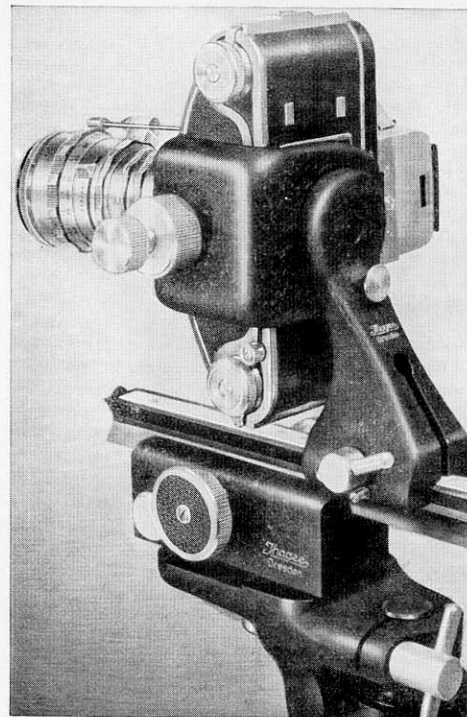


Fig. 11

of the bellows attachment. It is advisable to place the bellows top attachment (7) towards the front of the gliding rail (6/3) as far as the stop of the locking screw (6/7) and to lock the lens holder (7/2) in this position by turning down the lever (7/5) to the right. The screw (7/7) on the lens holder can now be released, permitting the camera holder to be moved to and fro on the gliding rail (6/3), as required for focusing. The camera holder (7/3), too, can be locked in position by turning down the lever (7/6) to the right. Of course, the lens holder (7/2) can also be moved.

When attaching the EXAKTA Varex to the camera holder (7/3), pay attention that the red dots on the two bayonet rings are exactly opposite each other. Then turn the camera to the right (in viewing direction) until the locking lever clicks into the bayonet fitting. The camera is now ready for upright exposures. If you intend working in the horizontal position, turn the camera back again by 90 degrees up to the stop. You are at liberty to use any standard or special supplementary lens to fit the EXAKTA Varex. Also when fixing the lens into the lens holder (7/2) the red dots on the bayonet fittings must meet. Insert the lens into the bayonet mount and turn it clockwise until the locking lever (7/8) Fig. 6 clicks in.

The smallest increase in extension obtainable with the aid of the bellows attachment is 35 mm., the greatest, approximately 220 mm. The 35 mm. extension increase, when using 50 or 58 mm. standard lenses, means focusing on relatively small objects. However, a 50 mm. special lens, f/2.8 with sunk mount, order No. 128, see Fig. 6, is now available, allowing also focusing at longer distances (up to infinity) with the bellows attachment, and for photographing larger objects on a smaller ratio. The black figures on the scale of the focusing slide (6) signify the increase in extension for the usual standard, short or long-focus lenses of the EXAKTA Varex, whereas the red figures refer to the increase in extension when using the 50 mm. special lens, f/2.8 with sunk mount. The scale values hold good only with the lens holder (7/2) at the front stop of the gliding rail (6/3). It is the measurement visible on the upright rear surface of the camera holder that counts. Should it be necessary, in any particular case, to adjust the lens holder (7/2) and to remove it from the front stop, the increase in extension can easily be calculated: the number recognizable on the back of the lens holder (7/2) has to be deducted from the number visible on the back of the camera holder (7/3), and the differ-

ence between these two figures is the increase in extension.

If the bellows top attachment (7) is to be removed from the focusing slide (6), it is by all means advisable, for the sake of preserving the bellows, after loosening the levers (7/5 and 7/6) to push the lens holder (7/2) and the camera holder (7/3) together to the point where they can be closely connected by clockwise rotation of the screw (7/7) — see Fig. 2. The locking screw (6/6) having been set with its lateral frased section on a level with the surface of the gliding rail (6/3), the bellows top attachment (7) can be drawn off the gliding rail.

Figs. 2 to 6, 12 and 13, and 26 to 31 show the bellows attachment fixed to the repro stand, while Figs. 16, 18, 20, and 34 represent methods of employing the bellows attachment independently, without using the repro stand.

The swing angle attachment

A second possibility of fastening the camera is given by the swing angle attachment. It consists of the focusing slide (6) and the swing angle top (8). This element, too, is pushed on to the gliding rail (6/3) of the focusing slide (6), it does not, however, in itself provide for an increase in extension.

Close-ups, in this case, have to be made with the customary extension rings and tubes (please refer to prospectus and instructions on "Macrophotography — Photomicrography with the EXAKTA Varex").

After loosening the lever (8/4), causing it to stand upright, push the swing angle top (8) on to the tail-end of the gliding rail (6/3) (recognizable by the larger scale values and by the rotatable locking screw (6/6) with the unilaterally frased head). Before the swing angle top (8) is pushed on to the gliding rail, this locking screw (6/6) must be set with the frased part of its head on a level with the gliding rail (6/3). With the swing angle top pushed on to the gliding rail, slightly tighten the locking screw (6/6), causing the round part of the screw head to project a little above the gliding rail, which will prevent the swing angle top from slipping off.

With the swing angle top in use, the scales on the gliding rail (6/3) become invalid. You are able to set the swing angle top and lock it in any desired position by turning down the lever (8/4) to the right. As shown in Fig. 11, the EXAKTA Varex is fastened to the angular piece (8/2) by means of the fastening screw (8/6). (The fastening screw 8/8 is designed for cameras with an English tripod socket). Remember that the counter-

nut (8/7) has to be screwed in between the angular piece (8/2) and the head of the fastening screw (8/6 or 8/8). As soon as the fastening screw has been driven deep enough into the tripod socket of the camera, the counter-nut must be screwed against the angular piece in order to give the camera a firm hold on the angular piece. To transpose the camera from the horizontal to the vertical position, or vice versa, the angular piece (8/2) is moveable in both directions on pulling out the fastening knob (8/5) on the support (8/3). The knob clicks in automatically when the angular piece (8/2) has completed a 90° rotation.

Figs. 7 to 11 show the swing angle attachment in connection with the repro stand, whereas in Figs. 15, 17, 19, 21, 23, 24, 32, and 33, you see the swing angle top as used independently, without the repro stand.

Focusing

The following fundamental rules should be observed in focusing: The image distance (= space between lens and film plane) required for the picture ratio is produced by extending the bellows attachment or, in case you are using the swing angle attachment, by inserting extension rings and tubes. In the vertical position, the object dis-

tance (= space between object and lens), naturally associated with the image distance, is roughly focused by fixing the head-piece (5) either on to the column foot (1/2), or on to the lower or upper column (2 or 3). Critical focusing is then performed by means of the cog-wheel mechanism of the focusing slide (6). With the apparatus horizontally positioned, the object must first be arranged at the approximate distance required, whereupon it is focused by moving the cog-wheel mechanism of the focusing slide (6). Where the object distance in relation to the bellows attachment remains unchangeable, adjustment of the image distance, and subsequent absolutely sharp focusing, is possible by backward or forward movement of the camera holder (7/3) on the gliding rail (6/3). This is an extraordinary advantage of the bellows attachment.

Focusing, and control of depth of focus are, as usual, performed on the reflex image of the EXAKTA Varex. Working with increased camera extension requires longer exposure time. Details concerning this subject, also with regard to scales of reproduction, object distance, image distance, etc., will be found in the instructions on "Macrophotography and Photomicrography with the EXAKTA Varex" as well as in the special

literature mentioned at the close of this booklet.

To facilitate focusing, we recommend a number of available accessories, especially for close-up and micro-work with the EXAKTA Varex, upon which particulars will be given on request: The Lens Magnifier permits using a highly corrected standard or special lens in place of the simpler magnifiers for focusing, revealing a sharp, powerfully magnified reflex image nearly free from distortion.

When a lens is not superfluous or unfit for use as magnifying glass, additionally a well corrected top lens is available as supplement of the Lens Magnifier.

The Distance Meter for the EXAKTA Varex Penta Prism works on the principle of the split-image rangefinder, rendering it possible to get the image into sharp focus, also under unfavourable lighting conditions.

With a long camera extension, and perhaps additional small lens aperture, a darkening down of the reflex image becomes unavoidable, so that it will seem desirable to focus through a clear spot in the ground glass straight on the bright image. Close-ups from a 1:1 ratio upwards can be made in this way with one of the special magnifiers in the finder hood, the Penta Prism, or

the Lens Magnifier. These magnifiers have a hairline cross in the clear spot; they are available, too, completely of clear glass, also with hairline cross. Individual types of magnifiers, with etched lines, squares, millimetre or centimetre divisions, etc., can be delivered on special order.

Finally, a few remarks have to be made regarding optical conditions in magnifier photography with standard lenses. These standard lenses are highly corrected for ordinary exposures based on long object distance and short image distance. But whenever the negative picture already appears enlarged – and this is the case with magnifier exposures – the image distance is greater than the object distance. Therefore, in order to maintain the full working capacity of the lens, it is advisable, for magnifier exposures (especially those with more than twofold enlargement), to reverse the lens, turning the rear element in the direction of the object. This is possible with the aid of special "lens reverse rings". On one side, these rings have the thread for the extension tubes or for the rear bayonet of the EXAKTA Varex, and on the other side is the thread to accept the front section of the lens mount. When ordering, please do not forget to mention name of lens, focal length and aperture, and whether the lens has automa-

tic pre-set diaphragm or diaphragm pre-setting device or no diaphragm pre-setting device. To fasten the "lens revers ring" to the lens carrier of the bellows attachment, the rear bayonet ring of the double-bayonet must first be screwed into the mount on the lens carrier.

Lighting Disposition

The Lighting Disposition (15), order No. 155.05, consists of the jointed holder system (15/1) with bolt, the cross-hole nut (15/2) and the supports (15/6), the two reflectors (15/3), the clamping ring (15/4) with the cross-hole bolt (15/5), and the cable (15/7). The disposition is used in combination with the repro attachments 1 and 2 for the uniform lighting of all reproduction objects or with other close-ups for lighting the subject.

For all the picture-taking with the lower column alone or with both the columns (lower and upper column together) the lighting disposition (15) is to be placed on the lower column with the aid of the clamping ring (15/4), (remove headpiece (5) in advance), see Fig. 12. About in the middle of the lower column the clamping ring (15/4) is to be fixed: For this purpose you must employ a metal peg (4 a or 4 b) for tightening the cross-hole bolt (15/5). Then, with the aid of the jointed holder system (15/1),

the reflectors (15/3) are set equidistant from the middle of the object. Don't bring about the light sources too near to the object, the greater distance only securing the uniform lighting of such objects, too, filling out the baseboard.

When, at smallest models and extremely small objects, the headpiece (5) shall be fastened on the column foot (1/2), the lighting disposition (15), too, is to be fixed on the column foot. The cross-hole nut (15/2) behind the clamping ring (15/4) must be loosened with a metal peg (4 a or 4 b) and unscrewed then. Thereupon draw out the bolt and remove the clamping ring (15/4). In order to be able to fix the holder system (15/1) on the column foot, you must put the supports (15/6) of the holder system left and right on the hole of the holder (1/4) and push the bolt through this bore-hole and through the holes of the two supports (15/6) (insert washer between holder (1/4) and right support). The cross-hole nut (15/2) is screwed upon the thread of the bolt and tightened fast with the metal peg, see Fig. 13.

Fig. 12: Repro attachment 1, with Lighting Disposition (put on the lower column)

Fig. 13: Repro attachment 1, with Lighting Disposition (put on the column foot)

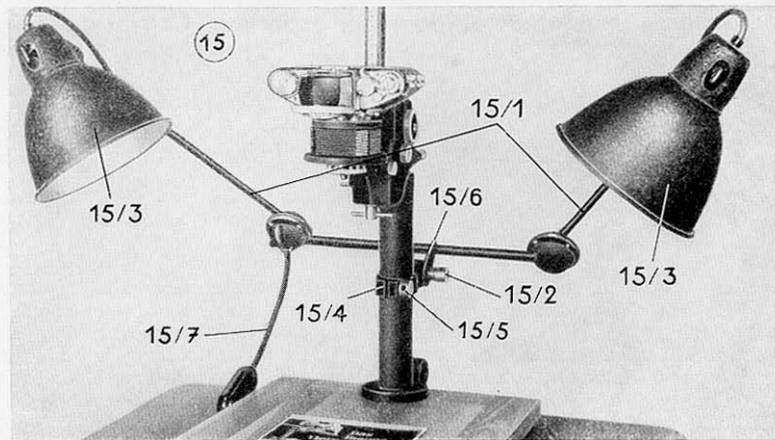


Fig. 12:
Repro attachment 1
with Lighting Disposition (put on the lower column)

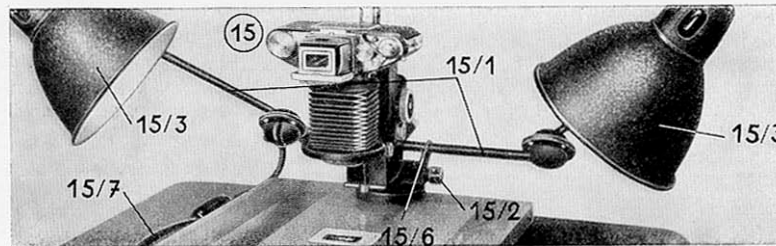


Fig. 13:
Repro attachment 1
with Lighting Disposition (put on the column foot)

patient is lying, must not be too large, to avoid difficulty in putting up the apparatus. The tripod must be sturdy and very easily adjustable, and suitable for locking in any position, for you may require exposures in all possible directions, with the apparatus placed vertically, obliquely, or horizontally. (The Gigant tripod, with the Gigant swing head, already mentioned, has proved to be most practical). If possible, the subject should be arranged to stand vertically to the optical axis. Where tangential exposures are unavoidable, they must be specifically named in the protocol of the exposures.

All exposures of the mouth interior can be made also through the medium of an ordinary speculum, thus enabling you to photograph the rear part of an incisor. As already pointed out in the instructions for use, it is of utmost importance to precisely adjust and concentrate the light rays of the pilot light beforehand on some test object (e. g. a text with small letters). You need then only to illuminate the real object by means of the pilot light without first having to look into the Penta Prism of the EXAKTA Varex. This comes next, when you have to focus through the Penta Prism, with the lens at full aperture, by turning the right-hand rack-and-pinion knob of the "Kolpofot". After stopping down the diaphragm, you are able once more to control the depth of field what, at the intensive pilot light, is possible without further ado. Then the shutter is released.

3. Exposures of the larynx –

especially the vocal cords (Fig. 9) – are somewhat complicated. It is generally known that with certain patients there is some difficulty in examining the larynx with the speculum. Skill and practice are necessary to make exposures of the larynx and the vocal cords.

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The patient has to be seated on a chair, the seat of which must not be too large, to enable convenient placing of the tripod close to it. Lean the patient's head against an adjustable support. As a rule, the patient will prefer holding the tip of his stretched out tongue himself with a handkerchief or a piece of crepe paper. An assistant holds the forehead firmly to prevent it from sinking forward (she may also hold the tongue) and sees to it that the mouth remains wide open.

Set up the "Kolpofot" with the optical axis in horizontal position or very slightly inclined upward or downward. The front edge of the Central Flash Unit is placed at a distance of about 12 to 15 cm. away from the mouth and has to remain in this position. The bulb of the pilot light is adjusted so as to direct the cone of light, which has to be as broad as possible, straight into the open mouth. Focusing on the rear part of the palate and on the uvula is performed by moving the camera holder to and fro with the left hand (do not actuate the rack-and-pinion knobs! The distance between the flash capsule and the mouth must remain unchanged). Introduce the pre-warmed speculum with your right hand into the anesthetized throat. The main factor now is, by inclining the larynx speculum or by slightly changing the position of the optical axis, to view the condition of the larynx over the speculum in the Penta Prism and to focus by means of the camera holder. As mentioned before, this is not quite a simple matter and needs some practice. After focusing a second assistant stops down the diaphragm and releases the shutter.

4. For exposures of the ear

(auditory passage, tympanum), the patient has to sit or lie down. Arrange his head so that the tripod can be placed conveniently near it, and introduce the usual ear funnel with its axis slanting

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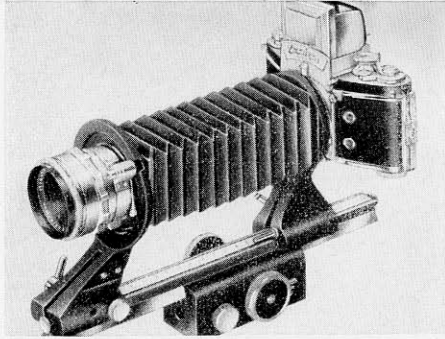


Fig. 16

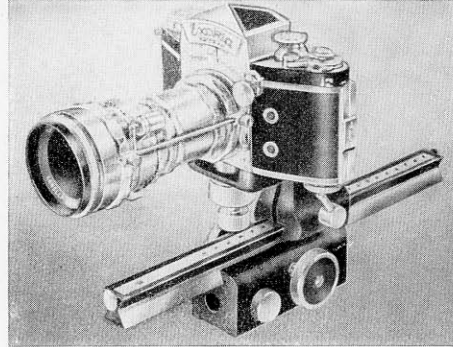


Fig. 17

But we advise using these devices fixed to a sturdy tripod, as shown in Figs. 18 to 21 and 32 to 34. A large tripod head (as e. g. the "Gigant" of Messrs. Berlebach, Mulda, Saxony) will be found very convenient, allowing the camera to be tilted or swung into any position within range of the object. The working parts can thus be arranged horizontally, obliquely, or vertically (Figs. 18 to 21 and 32 to 34).

Fig. 16: Bellows attachment standing on a table: horizontal position

Fig. 17: Swing angle attachment, standing on a table: horizontal position

Fig. 18: Bellows attachment fixed to tripod: horizontal position

Fig. 19: Swing angle attachment, fixed to tripod: horizontal position



Fig. 18

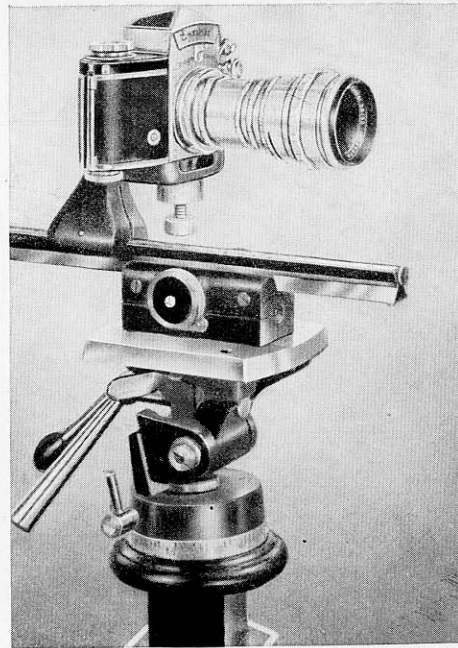


Fig. 19

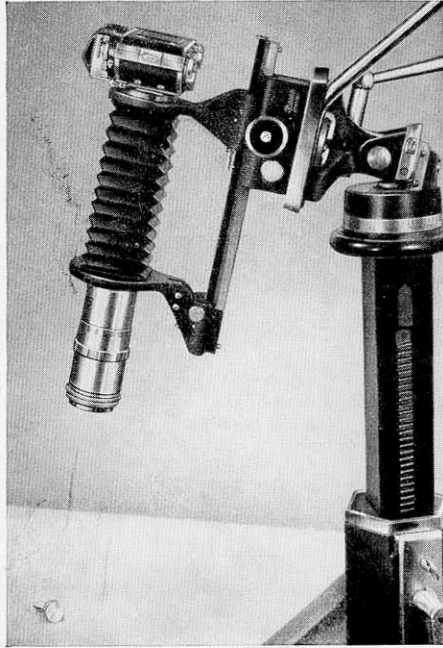


Fig. 20

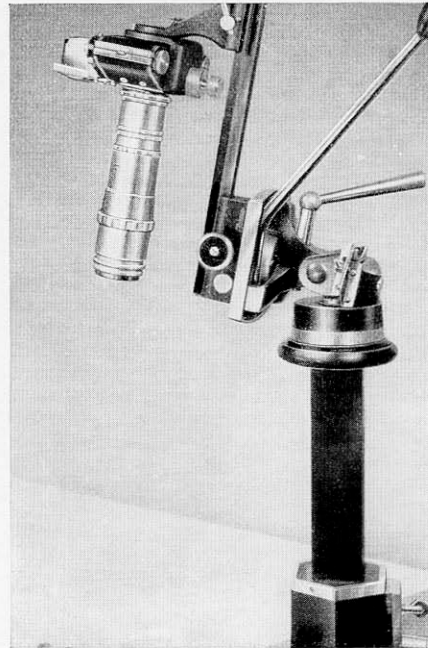


Fig. 21

Setting up and control of the individual parts have been described closely in section A on pages 9 to 12. The basic difference between the "bellows attachment" shown in Figs. 14, 16, 18, and 20 and the "swing angle attachment" shown in Figs. 15, 17, 19, and 21 lies in the fact that the swing angle attachment requires bayonet rings and extension tubes to increase the extension for close-up work, whereas in the bellows attachment this is effected by the bellows. Any scale of reproduction and the corresponding object and image distances within the range of its extension can be continuously adjusted by means of the bellows, saving considerable time where the equipment is in constant use with frequent change of ratio.

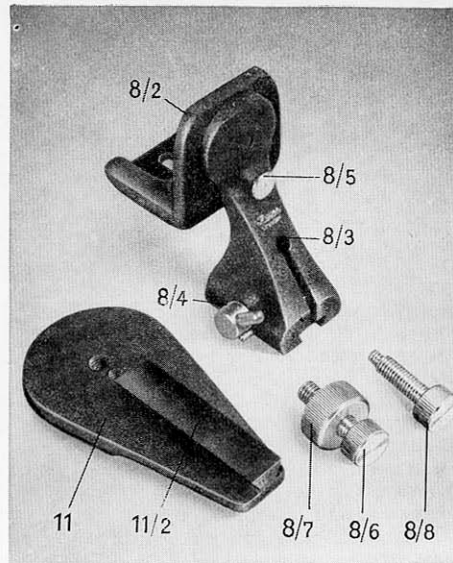


Fig. 22

Fig. 20: Bellows attachment fixed to tripod: vertical position

Fig. 21: Swing angle attachment, fixed to tripod: vertical position

Fig. 22: Tripod plate and swing angle top: single parts

C: The use of the tripod in connection with long-focus or heavy lenses

Equipment:

Tripod plate (11), order No. 155.13, Fig. 22, and swing angle top (8), order No. 155.03.

Should you not yet be in possession of the swing angle top (8) and intend ordering it for the purpose of working as described below, we request you to state whether your camera has an English or continental tripod socket.

Tripod plate with swing angle top

An extra simple supplementary part, the tripod plate (11), equipped with continental and English thread, has been designed for special work with the swing angle top. It can be screwed to any tripod. On the tripod plate is a short gliding rail (11/2) to accept the swing angle top (8), on which particulars have been given on page 11. The tripod plate will be found most convenient where the EXAKTA Varex is being used with long-focus or very heavy lenses (without a tripod socket of their own), perhaps, too, with an extra extension increase by means of adapter rings and tubes – see Fig. 23. In order to balance out the weight in such

cases and to ensure tripod steadiness and vibrationless working of the camera, the swing angle top (8) with the camera on the gliding rail (11/2) has to be pushed away from the vertical axis of the tripod until the whole apparatus is equally balanced – as shown in Fig. 23. Also, the movements of the swing angle top (8) on the gliding rail (11/2) of the tripod plate prove very practical in close-up work. Tripod with camera can be set up firmly in front of the object, nevertheless there is still sufficient play for focusing, due to the fact that the swing angle top (8) can be moved to and fro on the gliding rail (11/2).

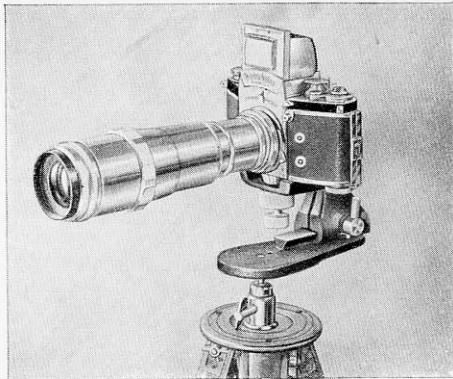


Fig. 23

Fig. 23: Tripod plate and swing angle top balancing long-focus lens on tripod



Fig. 24

Fig. 24: Tripod plate and swing angle top: Focusing by movement of swing angle top on gliding rail of tripod plate

D: Transparencies, negative copies of colour transparencies, etc.

Equipment:

Transparency copy equipment (12) with transparency copying screen (12/15), order No. 155.04, Fig. 25.

Optional extras:

Bellows attachment (black), order No. 155.10, and repro stand, order No. 155.01, Figs. 26 and 27, extension increase by bellows of bellows attachment.

The transparency copy equipment

The desire to make transparencies from 35 mm. black-and-white and colour negatives, and 35 mm. duplicate negatives from reversible transparencies, led to the designing of the Transparency Copy Equipment (12). This equipment is fixed to the repeatedly mentioned focusing slide (6) and screwed tight. Copying is an optical performance based on EXAKTA Varex close-up photography, necessitating the use of the bellows attachment.

For exposures at a ratio of 1:1 the extension increase must be equal to the focal length at the lens in use. The scale of the bellows attachment has to be set to an extension increase equal to the focal length of the lens.

The transparency copy equipment has to be fixed to the focusing slide (6) by means of the coupling rod (12/3), as shown in Figs. 26 and 27. For this purpose, you will find a round hole on the front surface of the sliding track, into which you will be able to push the coupling rod (12/3). Tighten the little knob (6/8), and the transparency copy equipment is fastened securely to the focusing slide. The transparency copy equipment (with bellows attachment) is generally chosen for 35 mm. objects in the horizontal position in connection with the repro attachment 1 (without columns), see Figs. 26 and 27. You will find it most convenient to do this kind of work sitting down and looking straight into the penta prism of the EXAKTA Varex in viewing direction (of course, the reflex finder, too, can be used for focusing).

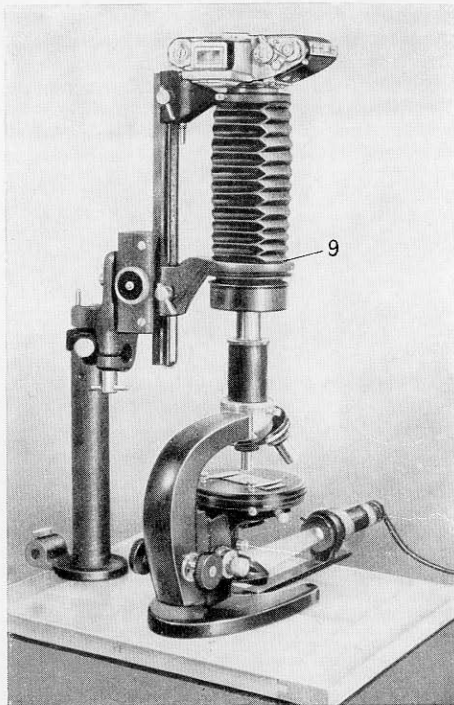


Fig. 28

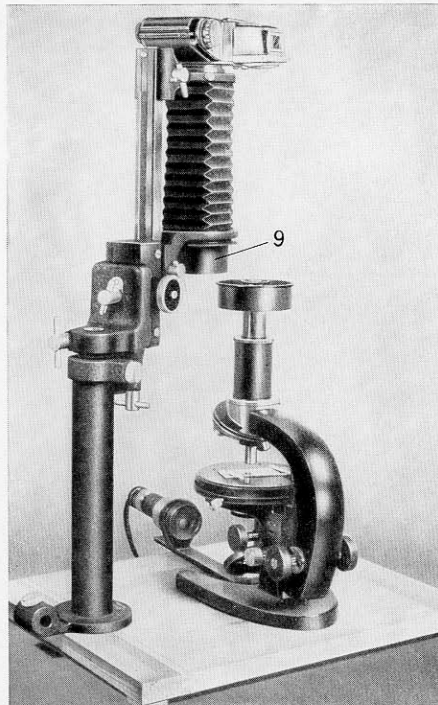


Fig. 29

been thus adjusted, the image in the ground glass (12/11) must lie precisely between the long edges of the film window in the camera. After final adjustment, the lever (12/10) must be tightened again. To mark the correct adjustment we advise making a pencil stroke on the holder (12/14) at the point designated by the arrow (12/13) in Fig. 25. This adjustment always has to be observed when making duplicate negatives and transparencies on a reproduction scale of 1 : 1. The object needs only to be placed accurately into the picture gate (12/6) and upon focusing either in the finderhood or in the Penta Prism of the EXAKTA Varex with the aid of the rack-and-pinion knobs (6/4 and 6/5) you have exactly the 1 : 1 image. After this adjustment it is no longer necessary to watch the reflex image as long as your exposures are being made on the 1 : 1 ratio. It is advisable to stop down the diaphragm to $f/8$.

To avoid penetration of outside light, a transparency copying screen (12/15) has to be fixed at the projections (12/8) on the picture gate (12/6). To avoid outside light especially from the picture gate (12/6), it is profitable to work with the transparency copy equipment in a slightly darkened room.

As already mentioned, the single negatives, or negative strips, are inserted into the un-

folded picture gate (12/6). Film trays (12/9) on both sides hold the ends of the strips. It is advisable to use the folded paper masks to push in the negative strips. The mask projects from the sides of the picture gate and can be moved sideways in both directions for critical adjustment of the picture outline in the 1 : 1 ratio and also when reproducing smaller singled-out parts of films. (See next section.) To make negative copies of 5×5 cm. ready mounted transparencies, the latter are inserted into the frame behind the projections (12/8). Exposure takes place by means of the EXAKTA Varex shutter.

As a rule, the scale of reproduction will be 1 : 1. It is also possible, however, to select smaller parts of a negative for the copy. This, of course, requires a somewhat longer camera extension, attainable, e. g., in the distance between camera holder and lens holder (7/3 and 7/2) in the bellows attachment. The negative is laterally adjustable in the picture gate (12/6), and the whole picture gate itself is arranged for vertical adjustment. The latter is achieved as before mentioned by loosening the lever (12/10) and moving the picture gate slightly up or down. The picture gate is fastened in position by turning down the lever.

26

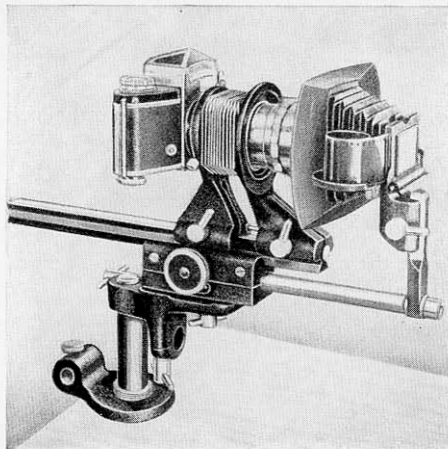


Fig. 26: Transparency copy equipment with repro attachment 1: fixed to column foot

Focusing is accomplished optically, based on the reflex image of the EXAKTA Varex, and mechanically by actuating the cog-wheel mechanism of the focusing slide (6). Figs. 26 and 27 show the normal horizontal working position with repro attachment 1 (without columns).

27

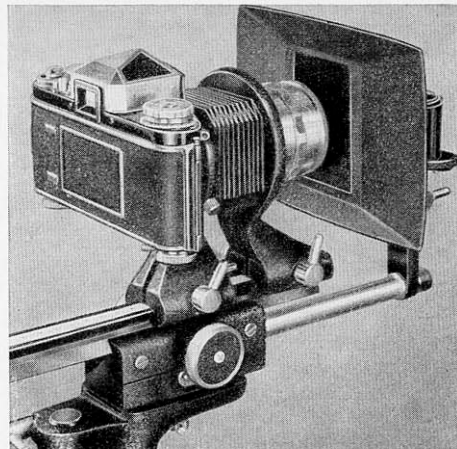


Fig. 27: Repro attachment 1 with transparency copy equipment: suitable horizontal position

For the optical reproduction of 35 mm transparencies from larger negatives it is best to work with the apparatus in vertical position, using the repro stand and some kind of lightbox, as in Fig. 5. (See also note on page 2.)

E: Micro exposures

Equipment:

Repro attachment 1, order No. 155.14, consisting of repro stand, order No. 155.01, and bellows attachment (see section A), order No. 155.10, and light protection tube (9) to screw into the lens holder (7/2), as in Fig. 1, order No. 156.

For magnifier exposures with a microscope Lg, an additional microscope ring II (10) – Fig. 1 – Order No. 157, is available.

We take it for granted that your equipment includes the microscope with lighting arrangement and light-protection tube to be slipped on to the ocular mount.

Repro attachment 1

You know, of course, that it is possible to connect the EXAKTA Varex to any usual type of microscope with the aid of one of the microscope attachments. Many experts, however, avoid bringing the camera into direct contact with the microscope. This is possible with the Vielzweck too. EXAKTA Varex and microscope can be used in one without being mechanically fixed together. For this purpose you need the repro attachment (Figs. 28 to 31, and section A., pages 9 to 12). Screw the light-protection tube (9) into the threaded mount of the lens holder which, in this case, has no lens in it. You are sure to possess a second light-protection tube with your microscope, otherwise it

will be necessary to procure one from the manufacturer. This tube is slipped on to the ocular fitting of the microscope and, in order to avoid penetration of outside light, the two tubes are pushed into each other without, however, coming into close touch. The whole equipment stands in the vertical position. Extension increase, which influences the scale of reproduction on the film, is obtained by means of the bellows attachment. Details on this subject will be found in special publications on photomicrography. See references at the close of this booklet.

The photographic equipment is centered over the microscope so that the EXAKTA Varex, in this case without its own lens, is

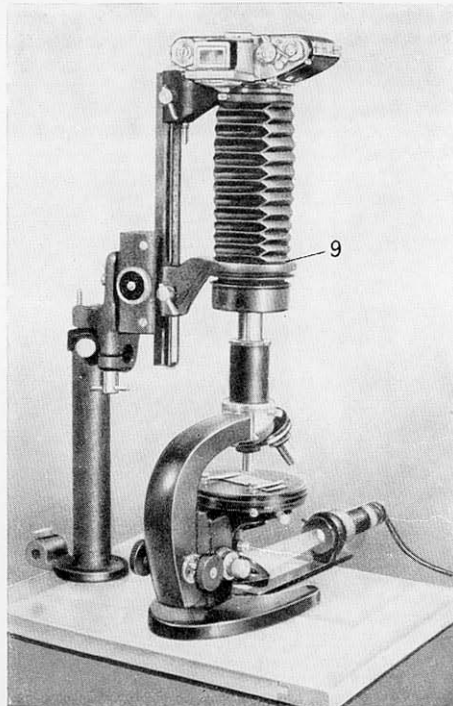


Fig. 28

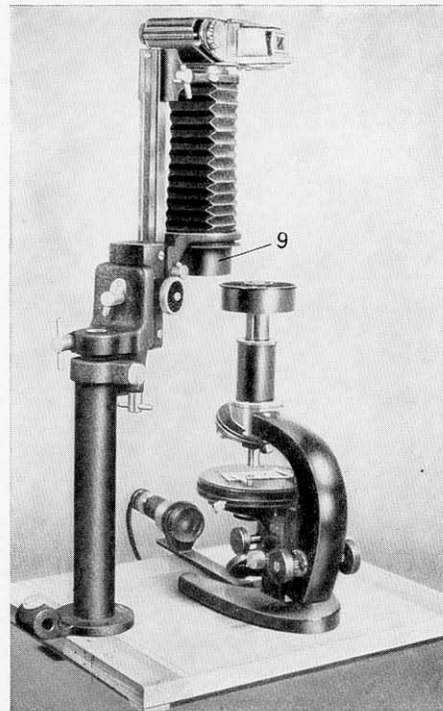


Fig. 29

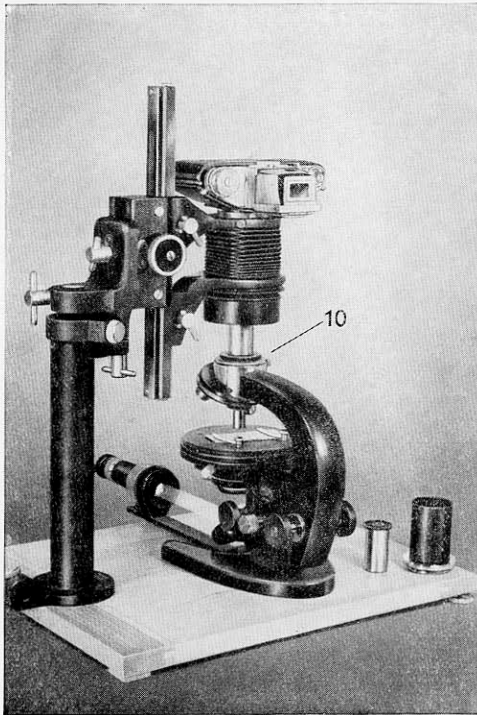


Fig. 30

precisely above the optical axis of the microscope. Thus, the image produced by the lens and ocular of the microscope is projected into the camera. Having centered the camera, you fasten the stop ring (2/2) on the lower column (2) – Fig. 1 – causing the headpiece (5) to touch the screw knob of the stop ring (2/2) – Fig. 28 –. If at any time you wish to interrupt your photographic work on the microscope, you push the lens holder (7/2) a little way up the gliding rail (6/3), disconnecting the light-protection tubes, loosen the fastening screw (5/3) of the headpiece, and you will be able to swing the complete equipment to one side, as shown in Fig. 29. On resuming your photographic work, you need not to repeat the centering performance, for you simply swing the equipment back to the stop marked by the stop ring (2/2). – The height of microscopes generally in use usually requires only the lower column (2) of the repro attachment. It might happen – owing

Fig. 28/29: Repro attachment 1 (repro stand with bellows attachment): vertical arrangement for micro-exposures. Left: working position, right: photographic equipment swung aside when not in use

Fig. 30: Repro attachment 1 (repro stand with bellows attachment): vertical arrangement for magnifier exposures with the microscope, using microscope ring II

to the height of the microscope – that the camera holder (7/2) is not quite near to the front locking screw (6/7). In case you interrupt your work, you push the lens holder (7/2) a little way up, as described before, and the whole equipment can easily be swung aside.

Should you intend making magnifier exposures on a smaller scale with Lg microscopes and with a similar arrangement as afore-mentioned, you may replace the ocular by a suitable lens for the microscope, e. g. the Mikrotar. The black tube of the microscope has to be removed and the special microscope ring II (10) – Fig. 1 – inserted into the rapid-exchange mount on the tube bearer of the Lg stand. At the top of the ring is the thread to take the ocular mount of the microscope. This mount has to be screwed out of the black microscope tube and screwed into the mount of the microscope ring II (10). The distance between lens and film plane now becomes smaller, corresponding to the smaller enlargement; the method of working, however, remains the same as described before. Fig.

Fig. 31: Repro attachment 1 (repro stand with bellows attachment) and microscope adapter No. 2: vertical arrangement for micro exposures, lifting ocular for focusing

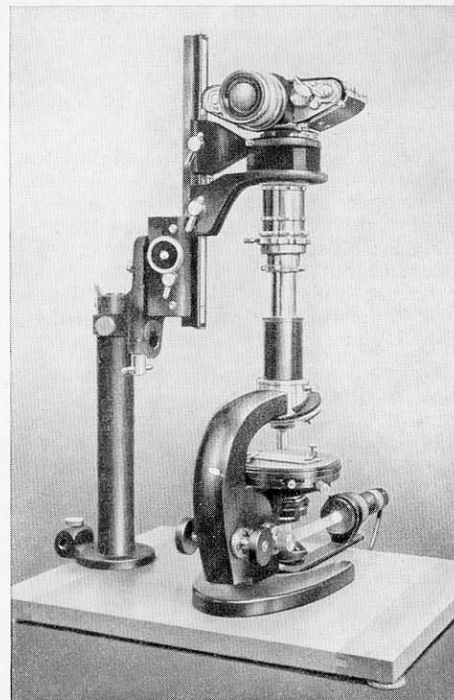


Fig. 31

30 shows how to arrange the equipment for microscope exposures of this kind with the aid of the microscope ring II (10).

Repro attachment 1 and microscope adapter No. 2

In photomicrography, lenses yielding up to 10 fold enlargements sometimes reveal optical under-correction, which can be decreased simply by lifting the ocular for focusing the reflex image in the camera. The equipment required consists of the repro attachment 1 and the microscope adapter No. 2 (order No. 153), as available for the EXAKTA Varex.

It is most convenient to place the microscope, as shown in Fig. 31, on the base-board of the repro stand. Remove the ocular of the microscope, separate the lower part of the microscope adapter from the upper part by loosening the milled screw, and fix the lower part on to the ocular mount; replace the ocular and fasten the lower part by turning the notched ring, at the same time catching hold of the rim.

Rejoin upper and lower part of the microscope adapter, but without fastening the milled screw. Place the microscope underneath the bellows attachment (with the EXAKTA Varex on top), forming a straight line from the axis of the microscope to the axis of the microscope adapter. By turning the cog-wheel of focusing slide (6), you are now able to lower the whole equipment until the bayonet ring at the top of the microscope adapter joins the bayonet mount of the lens holder (7/2). The red dots on bayonet ring and lens holder must meet. The bayonet ring having slipped into the mount, the upper part of the microscope adapter must be rotated until it snaps in. Tighten the milled screw on the rapid-exchange mount of the microscope adapter and loosen the clamp ring which, when working without the repro stand, normally fastens the microscope adapter to the microscope. On turning the rack-and-pinion knob of the focusing slide, the whole equipment, including the microscope adapter, will move and you are able to lift the ocular separately without the microscope lens.

F: Stereo Photography with swing angle attachment

Equipment:

Swing angle attachment, see Section B, order No. 155.08.

Focusing slide with swing angle

In stereo — 3 dimensional — photography you are not absolutely bound to make both exposures simultaneously, using two lenses or two prisms (Stereo Attachments). The two stereoscopic pictures can be taken in succession. The camera, in this case, has two different standpoints, and the distance between these two points is called the "base". The object must, of course, be motionless. The stereoscopic effect is considerably enhanced by "wide-base" exposures, in which the distance between the two pictures is not the usual 6.5 cm., as derived from the distance between the eyes, but where a greater lateral movement of the camera is possible. The swing angle attachment connected to a sturdy tripod, permits making stereo exposures with a base of almost 50 cm. The focusing slide (6) is fixed to the tripod at a right angle to the viewing line (Fig. 32 and 33). While pulling the knob (8/5), turn the angular piece (8/2) upwards, bringing the plate with the hole for the fastening screw to the top, ready to

accept the EXAKTA Varex at a right angle to the focusing slide for horizontal exposures. The camera is fastened by means of the screw (8/6 or 8/8) and the counter nut (8/7) is again screwed in between the head of the fastening screw and the angular piece (8/2), (Fig. 11). The stereo base is obtained either by adjusting the swing angle top (8) on the gliding rail (6/3) or by additional adjustment of the gliding rail itself, by means of the cog-wheel, on the sliding track (6/2).

Figs. 32/33 (next page): Swing angle attachment fixed to tripod: horizontal arrangement for stereo exposures. Left: camera on extreme left of wide-base, right: camera on extreme right of wide-base

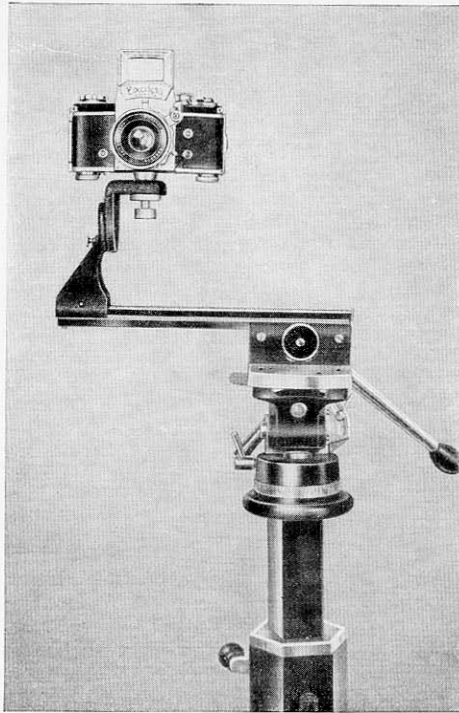


Fig. 32

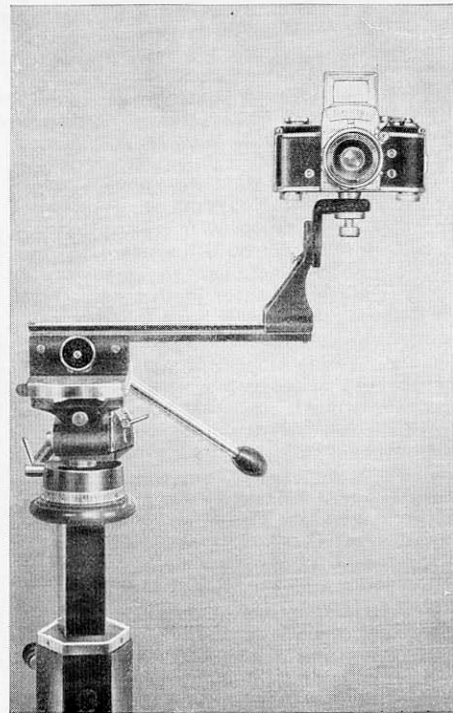


Fig. 33

G: Medical Photography: Cavities of the human and animal body

Equipment:

"Kolpofot" complete, order No. 155.11, consisting of "complete bellows attachment" ivory-colour varnish, bright parts in chrome finish (mechanical execution as in section B, Fig. 14), "special lens 135 mm. f/4", with diaphragm stops down to f/45, Central Flash Unit ZB 3, complete with ring flash tube, pilot light and 3 flexible cables (14), and carrier for a Reflector rod.

Special Lens: 135 mm. f/4, with especially small diaphragm, adjustable down to f/45, order No. 127.

Central Flash Unit ZB 3, complete with ring flash tube, pilot light and 3 flexible cables (14), order No. 155.09.

Carrier for Reflector rod, separate, order No. 155.12.

Further requirements for practical work with the "Kolpofot" will be:

a sturdy tripod with universal swing-and-tilt head, e. g. the "Gigant" tripod with the "Gigant" swing head, manufactured by Berlebach, of Mulda (Saxony),

an electronic flash unit (500 to 1000 volts) and a 6 volt, 15 watt transformer, or accumulator, for the pilot light.

(Flash unit and transformer are supplied in one, as Electronic Unit, for connection to the house circuit, by Elgawa, Plauen/Vogtland).

The Kolpofot

The Kolpofot, too, is part of the Vielzweck equipment, which, however, considering its use in the medical field, has a light-coloured varnish or chrome finish. The Kolpofot permits making any kind of magnifier

exposures, especially where objects in motion are concerned.

Fig. 34 (next page): Kolpofot = complete bellows attachment with long-focus lens and Central Flash Unit for medical photography (cavities of the human and animal body): horizontal position on tripod

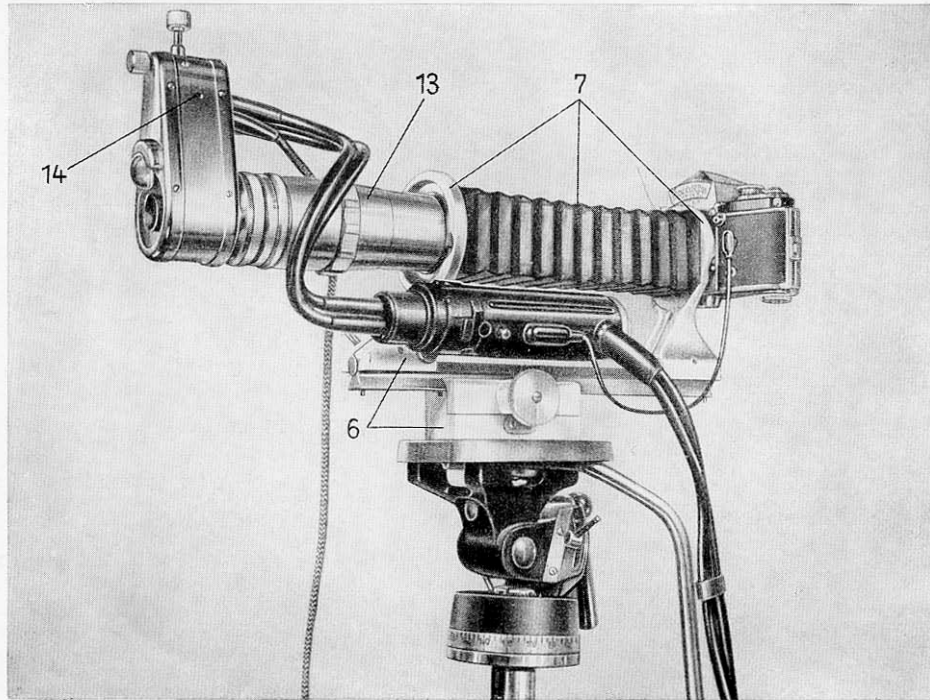


Fig. 34

This apparatus, which may also be used in other spheres of science, has proved most beneficial in photographing the eyes, the skin, the teeth, etc. But it is chiefly used for taking photographs of cavities of the human and animal body (vagina, mouth, throat, etc.). Experience has taught in a most convincing manner that the Kolpofot plays an extremely important part in the struggle against uterine cancer, for, in spite of astonishingly simple operation, it yields intravaginal exposures of such clarity, even in the finest structures, that these documents suffice for the diagnosis. The Kolpofot has made it possible to carry out organized examinations similar to the pulmonary X-ray examinations.

The bellows attachment used in this case permits extreme-sharp focusing. You work with the Penta Prism in the EXAKTA Varex, fitted with a hair-lined clear glass magnifier, which reveals a relatively bright reflex

image, even at a very small diaphragm stop. For focusing, the object is illuminated by a pilot light, but the exposure is made with a synchronized flash tube whose short ignition period almost completely eliminates any distortion which may be caused by the patient. Due to the long-focus lens, the 135 mm. special lens $f/4$, you have the convenient object distance of approximately 20 cm. and also, in combination with the long bellows extension, up to about 1,6 fold enlargement in the negative. The viewing system in the EXAKTA Varex Penta Prism reveals this image approx. 7 times larger for focusing, so that even in critical cases every structural detail is perfectly recognizable. For obtaining extraordinary depth of focus, this special lens may be stopped down to $f/45$.

Detailed instructions for using the Kolpofot are available on request.

The EXA and Vielzweck Multi-combination

The chance to employ the Ihagee-Vielzweck in combination with the EXA is limited, considering the more simple construction of this camera.

There is no possibility for:
lantern slides (transparencies), making of

intermediate-transparencies, photographing of cavities of the human body, medical photography.

As to the possibilities to use our EXA with long-focus lenses and close-ups, we beg to refer you to the EXA instruction-booklet.

The contents of this booklet requiring, to some extent, some knowledge regarding the application of the EXAKTA Varex and its accessories as well as general skill in the photographic field, we call your attention to some prospectuses, instruction booklets, and special literature. Please apply to our Export Department, which will be pleased to supply – if in stock – brochures and instruction booklets free of charge. Please let us know what you take an interest in!

Special Literature:

"EXAKTA Kleinbild Fotografie" by Werner Wurst. The authoritative, complete instruction book (Published by W. Knapp, Halle/Saale).

"EXAKTA Makro- und Mikro-Fotografie" by Georg Fiedler. An indispensable guide for two of the most important spheres of EXAKTA Varex photography (Published by W. Knapp, Halle/Saale).

"Kleinbild-Stereo-Nahaufnahmen" by Dr. W. Pietsch. A brochure full of information on three-dimensional photography with the EXAKTA Varex (Published by W. Knapp, Halle/Saale).

"Foto-Exkursionen mit der EXA" by Werner Wurst. (Published by W. Knapp, Halle/Saale).

"Kolpofotogramme" Volumes 1, 2, and 3, by Robert Ganse M. D. An introduction to colpophotography with the EXAKTA Varex (Published by Akademie-Verlag, Berlin NW 7).

Further publications:

"EXAKTA Tips" by Werner Wurst. A short preliminary study dealing with the main points in EXAKTA Varex photography (Published by Heering-Verlag, Seebruck/Chiemsee).

These books are available only at special book stores.



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